

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2021/0062929 A1 Peret et al.

(43) **Pub. Date:** Mar. 4, 2021

(54) FLOW METER AND RELATED METHOD

(71) Applicant: **DEKA Products Limited Partnership**, Manchester, NH (US)

(72) Inventors: **Bob D. Peret**, Bedford, NH (US); Derek G. Kane, Manchester, NH (US); Dean Kamen, Bedford, NH (US); Colin H. Murphy, Cambridge, MA (US); John M. Kerwin, Manchester,

NH (US)

(21) Appl. No.: 17/097,433

(22) Filed: Nov. 13, 2020

Related U.S. Application Data

(63) Continuation of application No. 16/585,561, filed on Sep. 27, 2019, now Pat. No. 10,844,970, which is a continuation of application No. 16/162,609, filed on Oct. 17, 2018, now Pat. No. 10,436,342, which is a continuation of application No. 15/943,238, filed on Apr. 2, 2018, now Pat. No. 10,113,660, which is a continuation of application No. 15/785,926, filed on Oct. 17, 2017, now Pat. No. 9,976,665, which is a continuation of application No. 15/672,994, filed on Aug. 9, 2017, now Pat. No. 9,856,990, which is a continuation of application No. 14/939,015, filed on Nov. 12, 2015, now Pat. No. 9,772,044, which is a continuation of application No. 14/213,373, filed on Mar. 14, 2014, now Pat. No. 9,435,455, which is a continuation-in-part of application No. 13/834,030, filed on Mar. 15, 2013, now Pat. No. 9,372,486, (Continued)

Publication Classification

(51)	Int. Cl.	
	F16K 27/00	(2006.01)
	A61M 5/14	(2006.01)
	A61M 5/168	(2006.01)
	A61M 5/172	(2006.01)
	G01F 1/66	(2006.01)
	G05B 15/02	(2006.01)

G05D 7/06	(2006.01)
G06K 9/40	(2006.01)
G06K 9/52	(2006.01)
G06K 9/62	(2006.01)
G06T 3/00	(2006.01)
G06T 5/00	(2006.01)
G06T 5/50	(2006.01)
G06T 7/00	(2006.01)
G06T 7/20	(2006.01)
G06T 7/60	(2006.01)
H04N 7/18	(2006.01)
G06K 9/20	(2006.01)

(52) U.S. Cl.

CPC F16K 27/00 (2013.01); A61M 39/284 (2013.01); A61M 5/1689 (2013.01); A61M 5/16804 (2013.01); A61M 5/16877 (2013.01); A61M 5/16886 (2013.01); A61M 5/172 (2013.01); G01F 1/661 (2013.01); G05B 15/02 (2013.01); G05D 7/0635 (2013.01); G06K 9/40 (2013.01); G06K 9/52 (2013.01); G06K 9/6201 (2013.01); G06K 9/6215 (2013.01); G06T 3/0093 (2013.01); G06T 5/002 (2013.01); G06T 5/50 (2013.01); G06T 7/0012 (2013.01); G06T 7/20 (2013.01); G06T 7/60 (2013.01); H04N 7/183 (2013.01); G06K **9/2027** (2013.01); A61M 2205/3306 (2013.01); A61M 2205/3334 (2013.01); A61M 2205/50 (2013.01); G06T 2207/20182 (2013.01); G06T 2207/20224 (2013.01); G06T 2207/30004 (2013.01); G06T 2207/30232 (2013.01); A61M *5/1411* (2013.01)

(57)ABSTRACT

A system for regulating fluid flow having a processor configured to reduce image noise is provided. The system includes an image sensor to capture an image of the drip chamber. The processor captures the image of the drip chamber using the image sensor, performs an edge detection on the image to generate a first processed image, and performs an AND-operation on a pixel on a first side of an axis of the first processed image with a corresponding mirror pixel on a second side of the axis of the first processed image to generate a second processed image.

